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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/726,521	12/04/2003	Young-Ho Lee	1349.1298	7200

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STAAS & HALSEY LLP  
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WASHINGTON, DC 20005

EXAMINER .

WERNER, DAVID N

ART UNIT	PAPER NUMBER
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2609

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/28/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/726,521

Applicant(s)

LEE, YOUNG-HO

Examiner

David N. Werner

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 January 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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### **DETAILED ACTION**

1. The Art Unit location of your application in the USPTO has changed. To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to Art Unit 2609.

#### ***Response to Arguments***

2. Applicant's arguments filed 26 January 2007 regarding claims 1-10 have been fully considered but are not persuasive. Claims 1-10 were previously rejected under 35 U.S.C. 103(a) over Hsieh et al. in view of U.S. Patent 6,072,833 (Yamauchi). Regarding claims 1-10, applicant contends that Yamauchi is not directed specifically towards the calculation of a horizontal reference vector *according to a vertical reference position*, as specified in claim 1 of the present invention, but only the addition of component horizontal and vertical motion vectors (page 6, lines 14-15). Applicant did not argue against the citation of Hsieh et al. as prior art. In addition to this rejection, Claims 8 and 11 were rejected under 35 U.S.C. 103(a) over Yamauchi, and claim 1 was previously rejected under 35 U.S.C. 103(a) over Yamauchi in view of US Patent 6,078,618 (Yokoyama). Claim 11 has been canceled.

#### ***Drawings***

3. Applicant's arguments, see page 5, filed 26 January 2007, with respect to the drawings have been fully considered and are persuasive. The objection to Figure 5 has been withdrawn. Figure 5 shows an arrow pointing from a block containing both first frame 110 and second frame 120.

***Claim Rejections - 35 USC § 103***

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsieh et al., in view of Yamauchi. Paragraph [0065] of the present invention reads,

“The offset control part 300 sequentially provides the first frame 110 and the second frame 120 to the horizontal motion vector calculation part 400, and the second frame 120 is shifted by a predetermined amount based on the vertical motion vector value applied from the vertical motion vector calculation part 200. That is, the offset control unit 300 **sets a vertical motion vector to a vertical reference position** of the second frame 120 at operation S300” [emphasis added].

Figure 5 shows a vertical motion vector as the output of vertical motion vector calculation part 200. The output of vertical motion vector calculation part 200 is also shown as an input to offset control part 300. In the Office Action of 26 October 2006, the examiner noted, without contrary argument, “the vertical reference positions for the horizontal motion vectors are deduced from the vertical motion vectors”. The examiner thus believes that a “vertical reference position” is the same as, or equivalent to, a vertical motion vector.

Regarding claims 1 and 8, figure 4 and figure 8 of Yamauchi each show vertical motion vector  $V_y$  as an input of memory 5. Memory 5, in turn, outputs to horizontal vector selector 3x. In one embodiment of Yamauchi, horizontal vector selector 3x shifts, “based on each of the prospective initial vectors provided from the motion vector memory 5, the coordinates of the block” (column 6, lines 20-22). Included in the “prospective initial vectors”, then, is the previous vertical

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motion vector  $V_y$ . Therefore, Yamauchi anticipates the feature of calculation of a horizontal reference vector according to a vertical reference position, overcoming the arguments presented. Yamauchi thus teaches the calculation of a motion vector by calculating a component vertical motion vector, using the vertical motion vector as a vertical reference position, and calculating a horizontal motion vector according to a vertical reference position.

Regarding claims 2-7 and 9-10, the applicant argues that the rejection of these claims on 26 October 2006 is dependent on an allegedly faulty rejection of claims 1 and claims 8 over Hsieh et al. in view of Yamauchi. However, since it is shown that Yamauchi contains the feature of calculating a horizontal motion vector, this argument is overcome. Regarding claims 2, 5, 9, and 10, Section III-B of Hsieh et al. shows an array of processing elements, each containing a shift register, an absolute difference calculator, and an adder. The shift registers store the value of each pixel, and the absolute difference calculator calculates the absolute differences between the pixel values of the current, or second, frame and the reference, or first frame. These absolute differences are iteratively summed in the adders and passed to the next processing element in the array, thus producing a series of sums of absolute differences. Using a one-dimensional array, a search region is limited to a row or column in a frame. Regarding claims 3 and 6, Section III-D of Hsieh et al. teaches a "Best Match-Selection Unit" that retains the least absolute difference in a register. Each calculated Mean Absolute Difference (MAD) value is compared with the current least MAD, and if smaller, becomes the new least MAD. These MAD values are

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inputted from a parallel adder that sums absolute differences between the current frame and a previous frame from each pixel. Regarding claims 4 and 7, the SAD value calculators each calculate a formula that is a special case of the MAD formula given in section I of Hsieh et al when block size  $n$  is set to 1. In claim 4, the vertical component  $v$  of candidate displacement vector  $(u,v)$  is set to zero, and in claim 7, horizontal component  $u$  of candidate displacement vector  $(u,v)$  is set to zero, and horizontal component  $i$  of pixel  $(i,j)$  is changed to  $i+mv$ , showing the displacement of the pixel according to the previously-calculated vertical motion vector or vertical reference position, as demonstrated by Yamauchi.

It is settled that Hsieh et al. discloses the claimed invention except for the calculation of a horizontal motion vector according to a vertical reference position. Yamauchi teaches that it was known to calculate a horizontal motion vector with respect to a previously calculated vertical motion vector. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to calculate a horizontal motion vector according to a vertical motion vector as taught by Yamauchi, because Yamauchi states at column 6, lines 57-61, that such a modification would "reduce detection errors occurring when vertical motion vectors change greatly at a time that the motion vectors are detected from interlaced pictures".

6. As there are no new grounds of rejection, **THIS ACTION IS MADE FINAL.**

Applicant is reminded of the extension of time policy as set forth in 37

CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David N. Werner whose telephone number is (571) 272-9662. The examiner can normally be reached on Monday-Thursday from 8:00 AM - 5:30 PM, and on alternate Fridays from 8:00 AM – 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey Stucker, can be reached on (571) 272-0911. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR

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system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service

Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DNW

*David N. Werner*



JEFFREY STUCKER  
SUPERVISORY PATENT EXAMINER